

**LIGHTHOUSE CHRISTIAN FELLOWSHIP (PWS 5420032)
SOURCE WATER ASSESSMENT FINAL REPORT**

July 31, 2001



**State of Idaho
Department of Environmental Quality**

Disclaimer: This publication has been developed as part of an informational service for the source water assessments of public water systems in Idaho and is based on data available at the time and the professional judgement of the staff. Although reasonable efforts have been made to present accurate information, no guarantees, including expressed or implied warranties of any kind, are made with respect to this publication by the State of Idaho or any of its agencies, employees, or agents, who also assume no legal responsibility for the accuracy of presentations, comments, or other information in this publication. The assessment is subject to modification if new data is produced.

Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. This assessment is based on a land use inventory of the designated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

This report, *Source Water Assessment for Lighthouse Christian Fellowship, Kimberly, Idaho*, describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The Lighthouse Christian Fellowship (PWS 5420032) drinking water system consists of one ground water source, Well #1. A check of the Idaho Drinking Water Information Management System (DWIMS) revealed past drinking water quality information for the Lighthouse Christian Fellowship drinking water system. No bacteria detections have been recorded for the system.

According to DWIMS, no inorganic compounds (IOCs) other than nitrates, volatile organic compounds (VOCs), or synthetic organic compounds (SOCs) were recorded for the Lighthouse Christian Fellowship Well. From August 1997 to September 2000, nitrate levels in the Well #1 water ranged from 4.9 milligrams per liter (mg/l) to 8.0 mg/l for four samples. The highest concentration of nitrates detected in Well #1 is 80% of the MCL for nitrate, 10 mg/l.

A Sanitary Survey conducted in 1997 recommended that Lighthouse Christian Fellowship install a screened, downturned vent tube for Well #1 in order to meet current State Requirements. In terms of total susceptibility, the Well #1 water rated high for susceptibility to IOCs, VOCs, SOCs, and microbial contaminants. High countywide farm chemical use, the presence of a nitrate priority area and an organics priority area for pesticides, the high percentage of agricultural land in the vicinity, aquifer properties, and the presence of multiple potential sources of contamination in the delineated source water assessment area contributed to the overall ratings for Well #1.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

For Lighthouse Christian Fellowship, source water protection activities should first focus on correcting, if corrections have not been completed, the deficiencies outlined in the 1997 Sanitary Survey. Since nitrate detections recorded in Well #1 approach the MCL, Lighthouse Christian Fellowship should investigate various systems like ion exchange, reverse osmosis, or activated alumina that could be used to treat nitrates. Any spills from the identified potential contaminant sources in the source water assessment area should be monitored carefully. Most of the source water protection designated area is outside the direct jurisdiction of Lighthouse Christian Fellowship. Twin Falls County has a Wellhead Protection Overlay District Ordinance that can provide additional protection for areas outside of the direct jurisdiction of Lighthouse Christian Fellowship. Partnerships with state and local agencies and industry groups should be established and are critical to success. Due to the time involved with the movement of ground water, source water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. Source water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil and Water Conservation District, and the Natural Resources Conservation Service.

A community with a fully developed source water protection program will incorporate many strategies. For assistance in developing protection strategies please contact the Twin Falls Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR LIGHTHOUSE CHRISTIAN FELLOWSHIP, KIMBERLY, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are attached. The list of significant potential contaminant source categories and their rankings used to develop the assessment also is attached.

Background

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

Level of Accuracy and Purpose of the Assessment

Since there are over 2,900 public water sources in Idaho, there is limited time and resources to accomplish the assessments. All assessments must be completed by May of 2003. An in-depth, site-specific investigation of each significant potential source of contamination is not possible. **Therefore, this assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (DEQ) recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a source water protection program should be determined by the local community based on its own needs and limitations. Wellhead or source water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The Lighthouse Christian Fellowship drinking water system is a non-community, non-transient system composed of one groundwater well, Well #1, serving approximately 100 people through one connection. The system is located in Twin Falls County, to the north of Kimberly, Idaho and to the south of the Snake River (Figure 1).

According to DWIMS, no IOCs (other than nitrates), VOCs, or SOCs were detected in the Lighthouse Christian Fellowship well water. The only significant chemistry issue facing the drinking water system is the presence of nitrates in the well water. From August 1997 to September 2000, nitrate levels in Well #1 ranged from 49% to 80% of the MCL for nitrate, 10 mg/l.

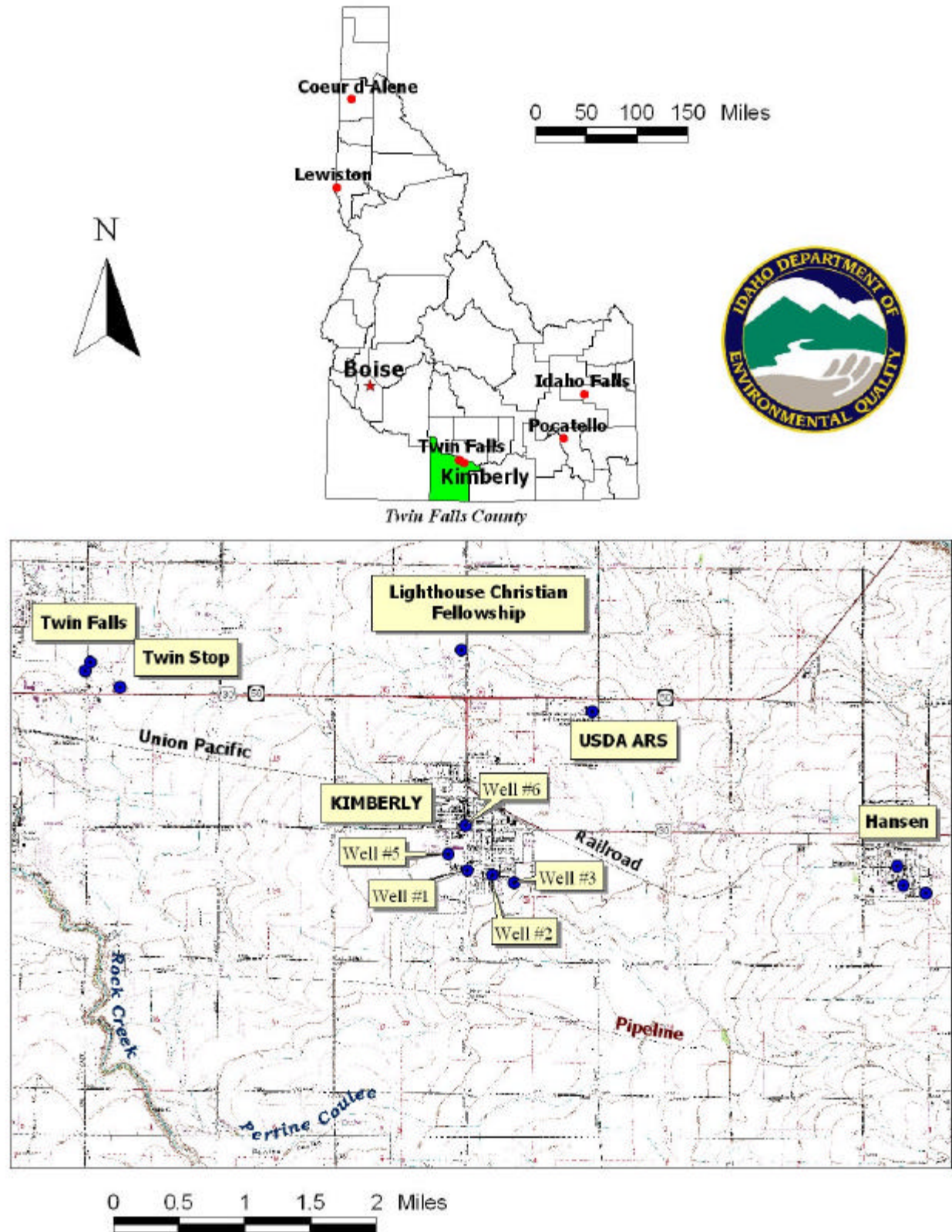
Defining the Zones of Contribution – Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel (TOT) zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ used a refined computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) TOT for water associated with the Snake River Plain Aquifer in the vicinity of Lighthouse Christian Fellowship. The computer model used site specific data, assimilated by DEQ from a variety of sources including the Lighthouse Christian Fellowship well log, other local area well logs, and hydrogeologic reports summarized below.

Well #1 extracts water from the Banbury Basalt which overlies the Idavada Volcanics. The Idavada Volcanics unit consists of welded ash and tuff, rhyolite, and some basalt flows. The Idavada Volcanics are up to 2,000 feet thick in the Kimberly area and contain fractures and columnar joints, allowing some mixing of the geothermal groundwater in the Idavada Volcanics with groundwater in the Banbury Basalt (Lewis and Young, 1989). The Banbury Basalt is of variable thickness and is the primary non-geothermal aquifer in the Kimberly area (Moffat and Jones, 1984). Basalt flows fracture at the surface as they cool. The fractures occur in the horizontal direction throughout the flow. The Banbury Basalt is fractured and contains thin sedimentary interbeds. These fractures and sedimentary interbeds comprise the water producing zones in the Banbury Basalt (Cosgrove, et al., 1997). Regional ground water flow is to the north, but may vary with proximity to major creeks and the Snake River (Lewis and Young, 1989).

The delineated source water assessment area for the Lighthouse Christian Fellowship well can best be described as a corridor approximately 0.8 miles wide narrowing to 0.5 miles wide and 5.1 miles long extending to the south from Lighthouse Christian Fellowship (Figure 2). The actual data used by DEQ in determining the source water assessment delineation area is available upon request.

Figure 1: Geographic Location of the Lighthouse Christian Fellowship



Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by DEQ and from available databases.

The dominant land use outside the Lighthouse Christian Fellowship area is irrigated agriculture and urban. Land use within the immediate area of the wellhead is predominantly irrigated agriculture.

It is important to understand that a release may never occur from a potential source of contamination provided they are using best management practices. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination. These involve educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A contaminant inventory of the study area was conducted during March 2001. This process involved identifying and documenting potential contaminant sources within Lighthouse Christian Fellowship Source Water Assessment area through the use of computer databases and Geographic Information System (GIS) maps developed by DEQ. The delineated source water area for Well #1 contains twenty-three potential contaminant sources, twenty of them in the 3-year time of travel (Table 1). Figure 2 shows the locations of these various potential contaminant sites relative to the wellhead.

Table 1. Lighthouse Christian Fellowship Well #1, Potential Contaminant Inventory

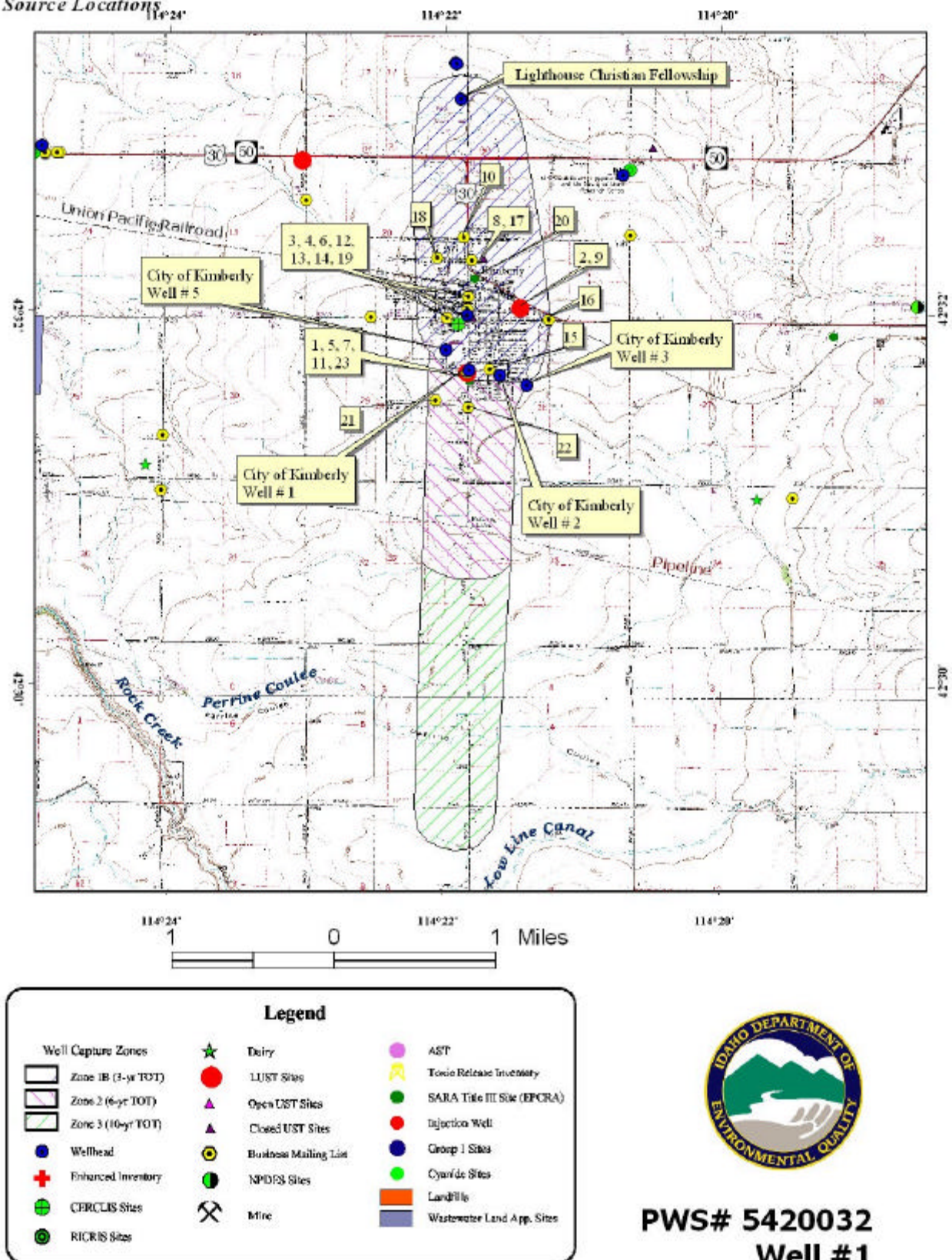
Site #	Source Description	TOT Zone ¹ (years)	Source of Information	Potential Contaminants ²
1	Site Cleanup Completed, impact unknown	0-3	Database Search	VOC, SOC
2	Site Cleanup Completed, impact unknown	0-3	Database Search	IOC, VOC, Microbes
3	Gas Station, open	0-3	Database Search	VOC, SOC
4	School District Facility, closed	0-3	Database Search	IOC, VOC, SOC
5	State Government Facility, closed	0-3	Database Search	IOC, VOC, SOC
6	Intermountain Bean Co.	0-3	Database Search	IOC, VOC, Microbes
7	Gas Station, closed	0-3	Database Search	VOC, SOC
8	Truck/Transporter, closed	0-3	Database Search	IOC, VOC, SOC
9	Snake River Bean, closed	0-3	Database Search	IOC, VOC, Microbes
10	Boat Dealer	0-3	Database Search	IOC, VOC, SOC
11	Automobile Repair and Service	0-3	Database Search	IOC, VOC, SOC
12	Feed Dealers	0-3	Database Search	IOC, SOC, Microbes
13	Cleaners	0-3	Database Search	VOC
14	Funeral Director	0-3	Database Search	IOC, SOC
15	Lawn Maintenance	0-3	Database Search	IOC, SOC
16	Automobile Repair and Service	0-3	Database Search	IOC, VOC, SOC
17	Feed Dealers	0-3	Database Search	IOC, SOC, Microbes
18	Feed Grinding	0-3	Database Search	IOC, SOC, Microbes
19	USDA Soil and Water Management Research	0-3	Database Search	IOC, VOC, SOC, Microbes
20	Animal Feed Preparation	0-3	Database Search	IOC, SOC, Microbes
21	Engravers, glassware	3-6	Database Search	IOC
22	General Contractor	3-6	Database Search	IOC, VOC, SOC
23	Gas Station, Convenience Store	3-6	Database Search	VOC, SOC

¹ TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead

² IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical



Figure 2. Lighthouse Christian Fellowship Delineation Map and Pontential Contaminant Source Locations



Section 3. Susceptibility Analyses

The water system's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

Hydrologic sensitivity was high for the Lighthouse Christian Fellowship drinking water well (Table 2). This reflects the nature of the soils being in the moderately-drained to well-drained class, the vadose zone (zone from land surface to the water table) being made predominantly of fractured basalt, first ground water being located within 300 feet of ground surface, and a lack of at least 50 cumulative feet of low permeability units (aquitard) that could retard downward movement of contaminants. The absence of an aquitard coupled with the soil and vadose zone properties of Well #1 allow for the downward migration of potential contaminants. The shallow depth to water decreases the potential for downward migrating contaminants to degrade (attenuate) through adsorption or other mechanisms.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. The Lighthouse Christian Fellowship drinking water system consists of one well that extracts ground water for domestic uses. The well system construction score was moderate for Well #1 (Table 2). A Sanitary Survey for the system was conducted in 1997 to determine if Well #1 was in compliance with wellhead and surface seal standards. The well has a properly maintained wellhead seal, however, a down-turned vent pipe was needed for Well #1. Well #1 is protected from surface flooding and is located outside the 100-year floodplain.

The Well #1 well log indicated that the highest water production zone is within 100 feet of the static water level. The casing was extended into a low permeability unit, protecting the well from potential migrating contaminants near the surface. The well log did not contain casing thickness or pump test information. Consequently, it was not possible to determine whether or not Well #1 meets current IDWR standards. Current standards require 0.28-inch thick casing for 6-inch diameter casing and a 4-hour minimum pump test for wells producing water at a rate less than 50 gallons per minute, as listed in the Recommended Standards for Water Works (1997).

The IDWR Well Construction Standards Rules (1993) require all PWSs to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the Recommended Standards for Water Works (1997) during construction. Under current standards, all PWS wells are required to have a 50 foot buffer around the wellhead. The 1997 Sanitary Survey indicated that the Lighthouse Christian Fellowship wellhead is located 21 feet from a 4-inch sewer service line.

Potential Contaminant Sources and Land Use

Well #1 rated high for susceptibility to potential IOC (e.g., nitrates), VOC (e.g., petroleum products), and SOC (e.g., pesticides) contamination. Agricultural land use, the presence of a nitrate priority area and an organics priority area (pesticides), high countywide farm chemical use, and the presence of multiple potential contaminant sources within the delineated source water assessment area contributed to the ratings. Well #1 rated moderate for susceptibility to potential microbial contaminants (Table 2). This rating is due to the fact that potential microbial contaminant sources in the delineated source water area are less numerous than for IOCs,

VOCs, and SOC. Table 1 lists the potential contaminant sources in the delineated source water area for the well. The locations of potential contaminant sources for Well #1 are shown on Figure 2.

Final Susceptibility Ranking

A detection above a drinking water standard MCL or a detection of a VOC or SOC at the wellhead will automatically give a high susceptibility rating to a well despite the land use of the area because a pathway for contamination already exists. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0 to 3-year time of travel zone (Zone 1B) and a large percentage of agricultural land contribute greatly to the overall ranking. The presence of a nitrate priority area and an organics priority area also contributes to the overall ranking. In terms of total susceptibility, the Lighthouse Christian drinking water well rated high for susceptibility to IOC, VOC, SOC, and microbial contamination (Table 2). High countywide farm chemical use, the presence of a nitrate priority area and an organics priority area for pesticides, the high percentage of agricultural land in the vicinity, aquifer properties, and the presence of multiple potential sources of contamination in the delineated source water assessment area contributed to the overall ratings for Well #1.

Table 2. Summary of Lighthouse Christian Fellowship Susceptibility Evaluation

Well	Susceptibility Scores ¹									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	Final Susceptibility Ranking			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Well #1	H	H	H	H	M	M	H	H	H	H

¹H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility,
IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Susceptibility Summary

According to DWIMS, no IOCs (other than nitrates), VOCs, or SOC were detected in the Lighthouse Christian Fellowship well water. Nitrates represent the main water chemistry recorded in the public water system. From August 1997 to September 2000, nitrate levels in Well #1 ranged from 49% to 80% of the MCL for nitrate, 10 mg/l.

A nitrate priority area and an organics priority area (for pesticides) crosses the delineated source water area of Well #1. Countywide farm chemical use is considered high, and the delineated source water area for Well #1 is surrounded by a significant amount of irrigated agricultural land. Additionally, multiple potential sources of contamination exist in the delineated source water area for Well #1.

Section 4. Options for Source Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective source water protection program is tailored to the particular local source water protection area. A community with a fully developed source water protection program will incorporate many strategies. For Lighthouse Christian Fellowship, source water protection activities should focus on correcting, if corrections

have not yet been completed, the deficiencies outlined in the 1997 Sanitary Survey. Since nitrate concentrations in the well approach the MCL, Lighthouse Christian Fellowship should investigate various systems like ion exchange, reverse osmosis, or activated alumina that could be used to treat nitrates. In order to achieve a 50-foot buffer zone around the wellhead, Lighthouse Christian Fellowship could investigate options for moving the 4-inch sewer line located 21 feet from the wellhead.

Lighthouse Christian Fellowship should be diligent about local businesses with potential IOC, VOC, SOC, or microbial contaminants. Any spills from the multiple potential contaminant sources in the delineated capture zone should be monitored carefully to prevent contaminants from infiltrating to the ground water producing zones. The highly fractured nature of the basalt aquifer could lead to cross-contamination from shallower fractures to deeper fractures depending on well construction. Most of the source water protection designated area is outside the direct jurisdiction of Lighthouse Christian Fellowship. Twin Falls County has a Wellhead Protection Overlay District Ordinance that can provide additional protection for areas outside of the direct jurisdiction of Lighthouse Christian Fellowship.

Partnerships with state and local agencies and industry groups should be established and are critical to success. Continued vigilance in keeping the wells protected from surface flooding can also keep the potential for contamination reduced. Due to the time involved with the movement of ground water, wellhead protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. Source water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil and Water Conservation District, and the Natural Resources Conservation Service.

Assistance

Public water supplies and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Twin Falls Regional DEQ Office (208) 736-2190

State DEQ Office (208) 373-0502

Website: <http://www2.state.id.us/deq>

Water suppliers serving fewer than 10,000 persons may contact John Bokor, Idaho Rural Water Association, at 1-800-962-3257 for assistance with wellhead protection strategies.

POTENTIAL CONTAMINANT INVENTORY LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as “Superfund” is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100-year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

References Cited

Cosgrove, D. M., Johnson, G. S., Brockway, C. E., Robison, C. W., *Geohydrology and Development of a Steady State Ground Water Model for the Twin Falls, Idaho Area*, 1997, Idaho Water Resources Research Institute, University of Idaho, Research Technical Completion Report.

Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 1997. "Recommended Standards for Water Works."

Idaho State Department of Agriculture, 1998. Unpublished Data.

Idaho Department of Environmental Quality, 1997. Design Standards for Public Drinking Water Systems. IDAPA 58.01.08.550.01.

Idaho Department of Water Administration, 1966. Groundwater conditions in Idaho. Water Information Bulletin No. 1.

Idaho Department of Water Resources, 1993. Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules. IDAPA 37.03.09.

Lewis, R. E., Young, H. W., *The Hydrothermal System in Central Twin Falls County, Idaho*, 1989, USGS Paper 88-4152.

Lewis, R. E., Young, H. W., *Geothermal Resources in the Banbury Hot Springs Area, Twin Falls County, Idaho*, 1982, USGS Water Supply Paper 2186.

Moffatt, R.L., Jones M. L., *Availability and Chemistry of Ground Water on the Bruneau Plateau and Adjacent Eastern Plain in Twin Falls County, South-Central Idaho*, 1984, USGS Water Resources Investigation Report 8404056.

Ralston, D. R., Young, N. C., *Water Resources of the Twin Falls Tract Twin Falls County, Idaho*, 1971, Idaho Department of Water Administration, Water Information Bulletin No. 22.

Attachment A

Lighthouse Christian Fellowship Susceptibility Analysis Worksheet

The final scores for the susceptibility analysis were determined using the following formulas:

- 1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)
- 2) 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

Final Susceptibility Scoring:

- 0 - 5 Low Susceptibility
- 6 - 12 Moderate Susceptibility
- ≥ 13 High Susceptibility

1. System Construction		SCORE			
	Drill Date	9/25/80			
	Driller Log Available	YES			
	Sanitary Survey (if yes, indicate date of last survey)	YES	1997		
	Well meets IDWR construction standards	NO	1		
	Wellhead and surface seal maintained	YES	0		
	Casing and annular seal extend to low permeability unit	YES	0		
	Highest production 100 feet below static water level	NO	1		
	Well located outside the 100 year flood plain	YES	0		
Total System Construction Score			2		
2. Hydrologic Sensitivity					
	Soils are poorly to moderately drained	NO	2		
	Vadose zone composed of gravel, fractured rock or unknown	YES	1		
	Depth to first water > 300 feet	NO	1		
	Aquitard present with > 50 feet cumulative thickness	NO	2		
Total Hydrologic Score			6		
3. Potential Contaminant / Land Use - ZONE 1A			IOC Score	VOC Score	SOC Score
	Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2
	Farm chemical use high	YES	2	0	2
	IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A			4	2	4
Potential Contaminant / Land Use - ZONE 1B					
	Contaminant sources present (Number of Sources)	YES	16	14	16
	(Score = # Sources X 2) 8 Points Maximum		8	8	8
	Sources of Class II or III leacheable contaminants or	YES	14	5	8
	4 Points Maximum		4	4	4
	Zone 1B contains or intercepts a Group 1 Area	YES	2	0	2
	Land use Zone 1B	Greater Than 50% Irrigated Agricultural Land	4	4	4
Total Potential Contaminant Source / Land Use Score - Zone 1B			18	16	18
Potential Contaminant / Land Use - ZONE II					
	Contaminant Sources Present	YES	2	2	2
	Sources of Class II or III leacheable contaminants or	YES	0	1	1
	Land Use Zone II	Greater Than 50% Irrigated Agricultural Land	2	2	2
Potential Contaminant Source / Land Use Score - Zone II			4	5	5
Potential Contaminant / Land Use - ZONE III					
	Contaminant Source Present	NO	0	0	0
	Sources of Class II or III leacheable contaminants or	NO	0	0	0
	Is there irrigated agricultural lands that occupy > 50% of	YES	1	1	1
Total Potential Contaminant Source / Land Use Score - Zone III			1	1	1
Cumulative Potential Contaminant / Land Use Score			27	24	28
4. Final Susceptibility Source Score			13	13	14
5. Final Well Ranking			High	High	High